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(54) **ENDOSCOPE ROTATIONAL AND POSITIONING APPARATUS AND METHOD**

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A61B 1/04	(2006.01)
A61M 16/00	(2006.01)
A62B 9/06	(2006.01)
A61B 19/00	(2006.01)
A61B 1/24	(2006.01)
A61B 17/34	(2006.01)

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CPC ***A61B 1/0014*** (2013.01); ***A61B 1/00039*** (2013.01); ***A61B 1/00149*** (2013.01); ***A61B 1/00154*** (2013.01); ***A61B 1/24*** (2013.01); ***A61B 19/26*** (2013.01); *A61B 2017/347* (2013.01)

(58) **Field of Classification Search**

CPC A61B 1/00131; A61B 1/00133; A61B 1/00147; A61B 1/00154; A61B 1/0016; A61B 1/267; A61B 1/2673; A61B 1/2676; A61B 1/273; A61B 1/2733; A61B 1/27736; A61B 1/31

USPC 600/102, 114, 120, 121, 125, 128, 124, 600/195; 128/861, 200.26, 207.14; 606/195

See application file for complete search history.

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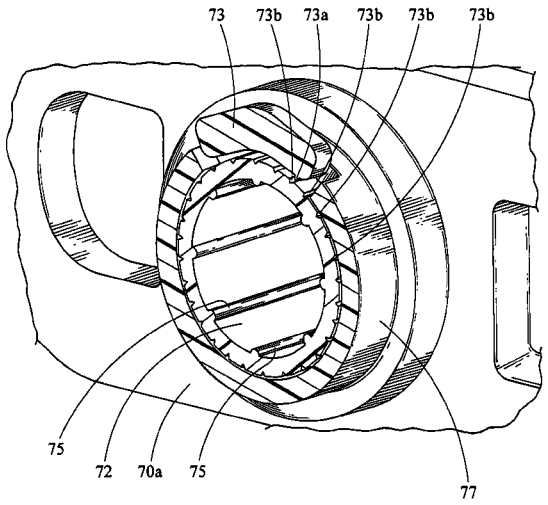
(57) **ABSTRACT**

An endoscope securing and positioning device is provided for adjusting or maintaining the position of an endoscope. The device allows the medical professional to easily rotate an endoscope or maintain its position without having to maintain a grip on the endoscope.

2 Claims, 19 Drawing Sheets



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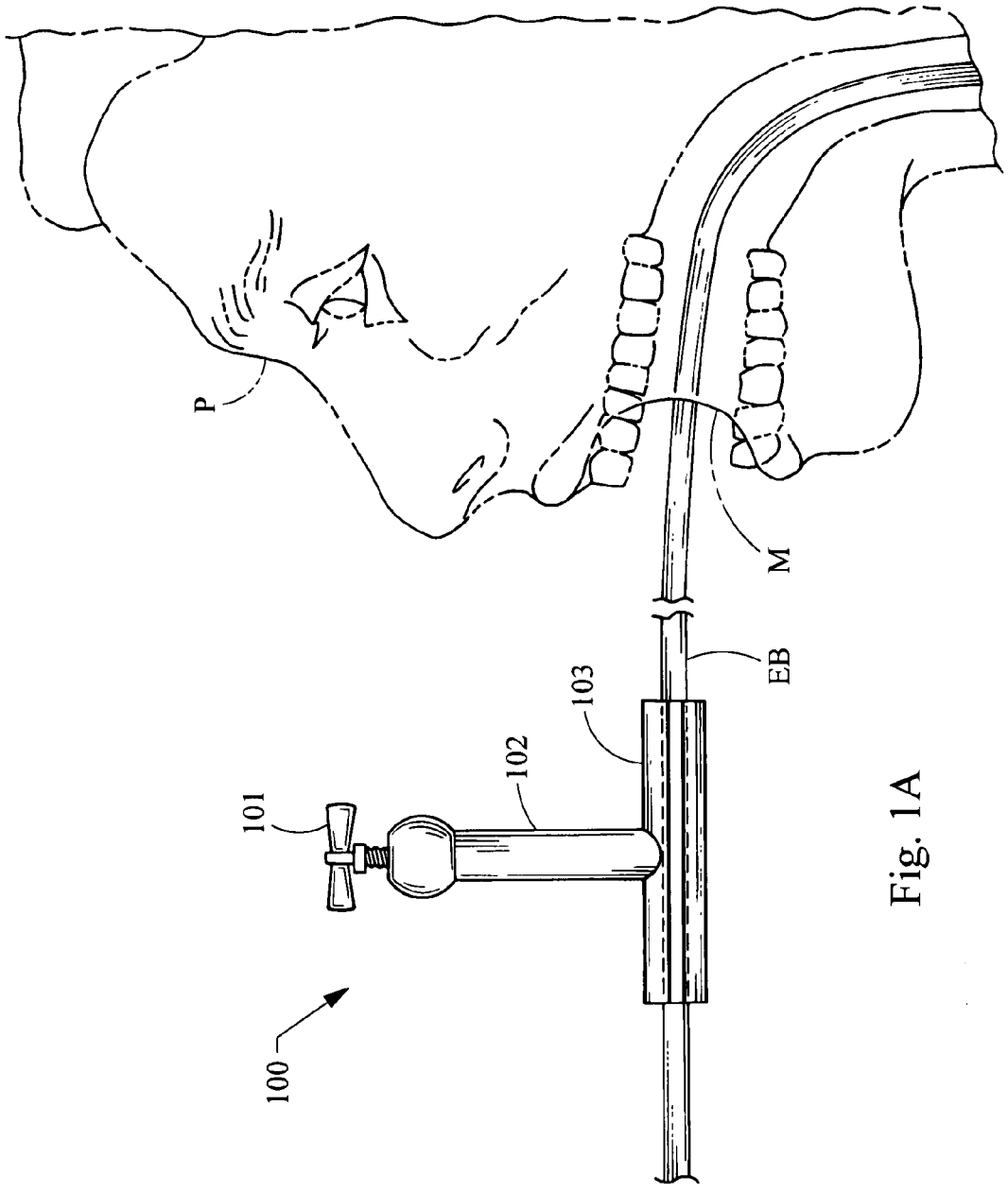

Fig. 1A

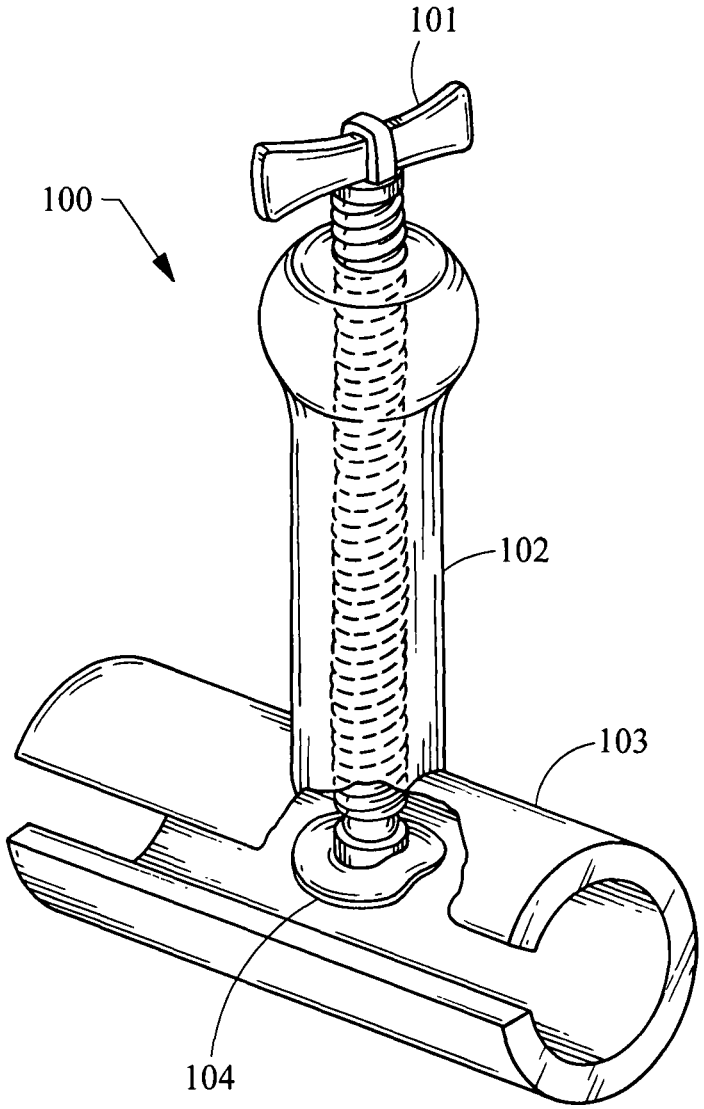

Fig. 1B

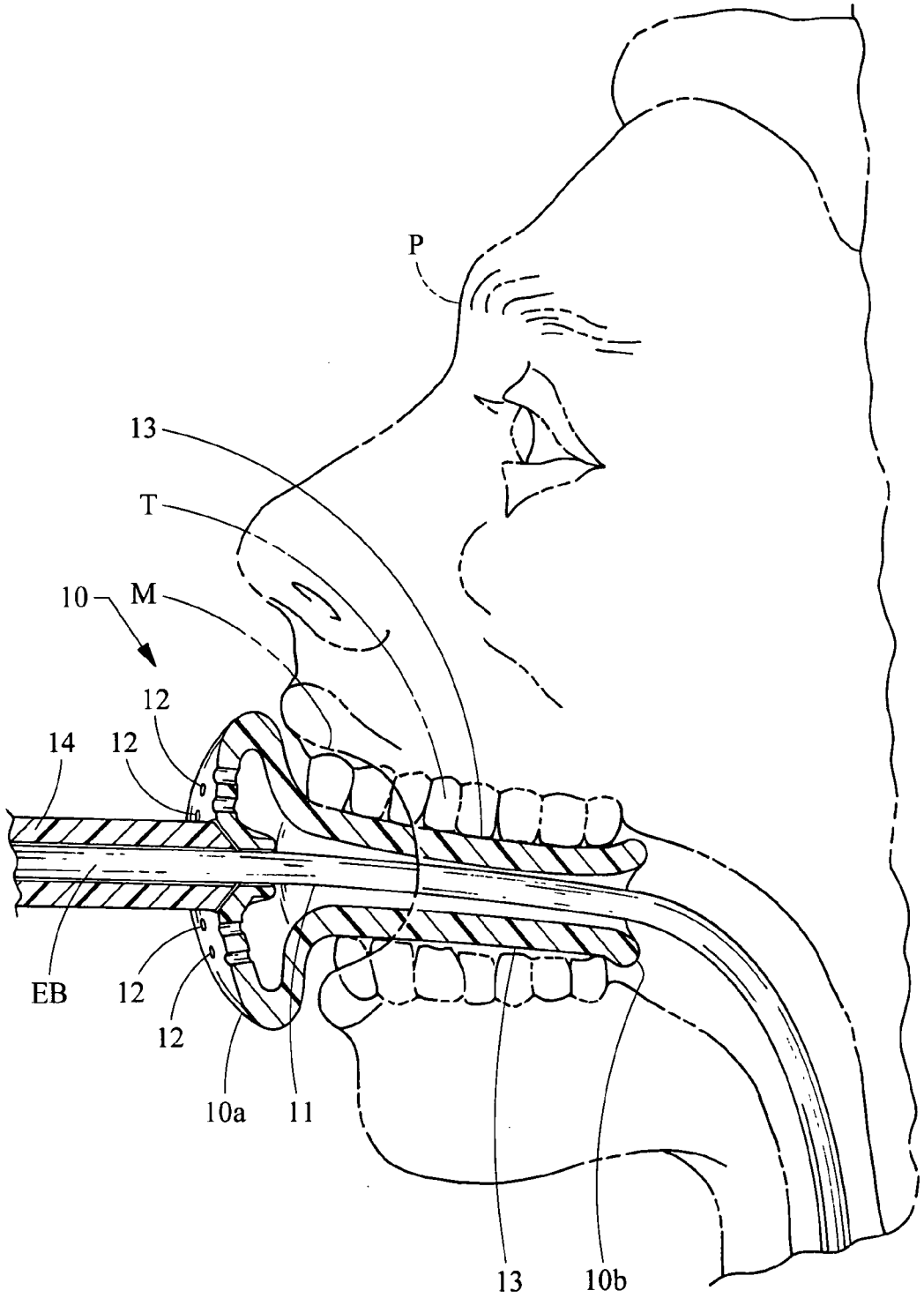

Fig. 2

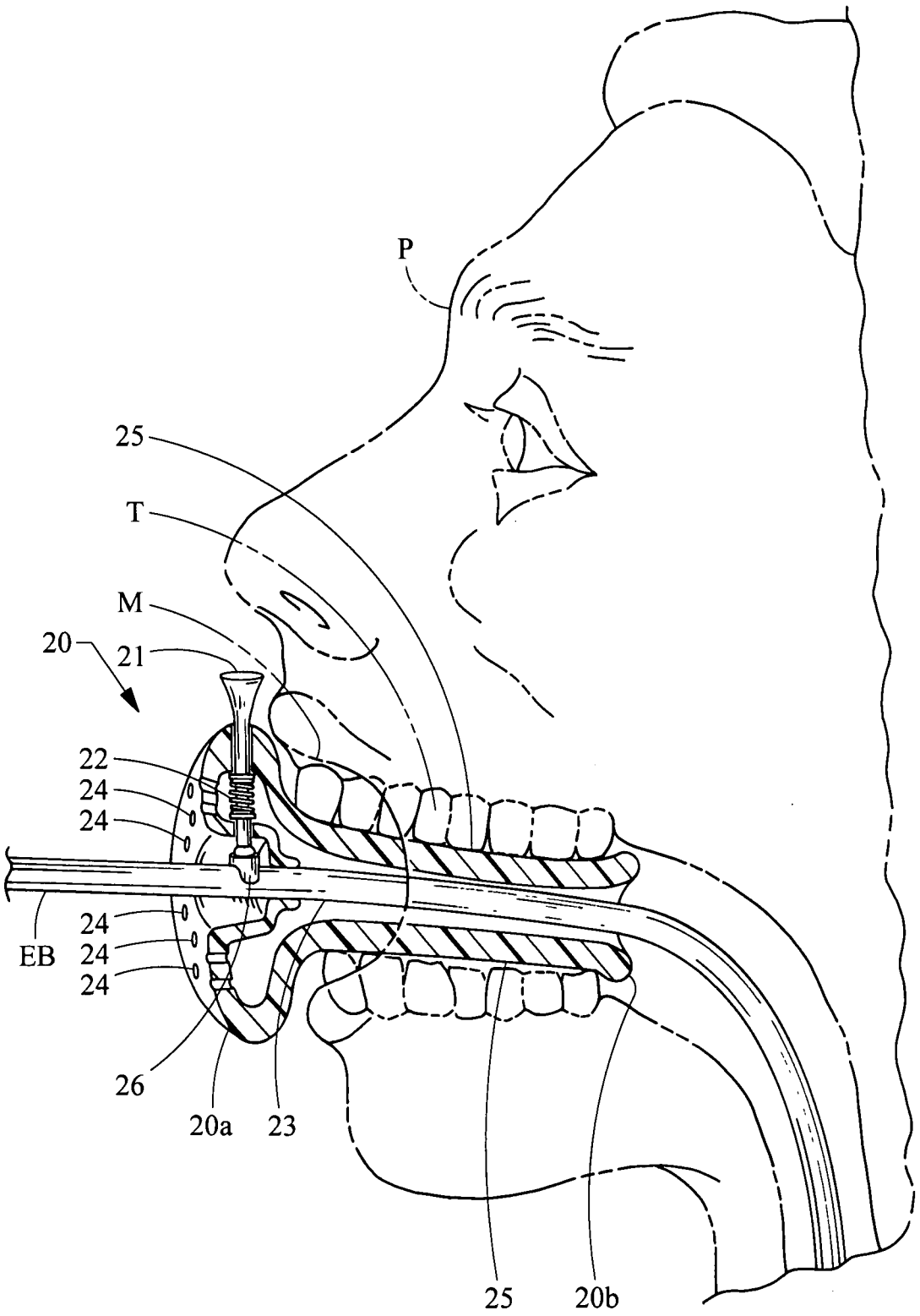

Fig. 3

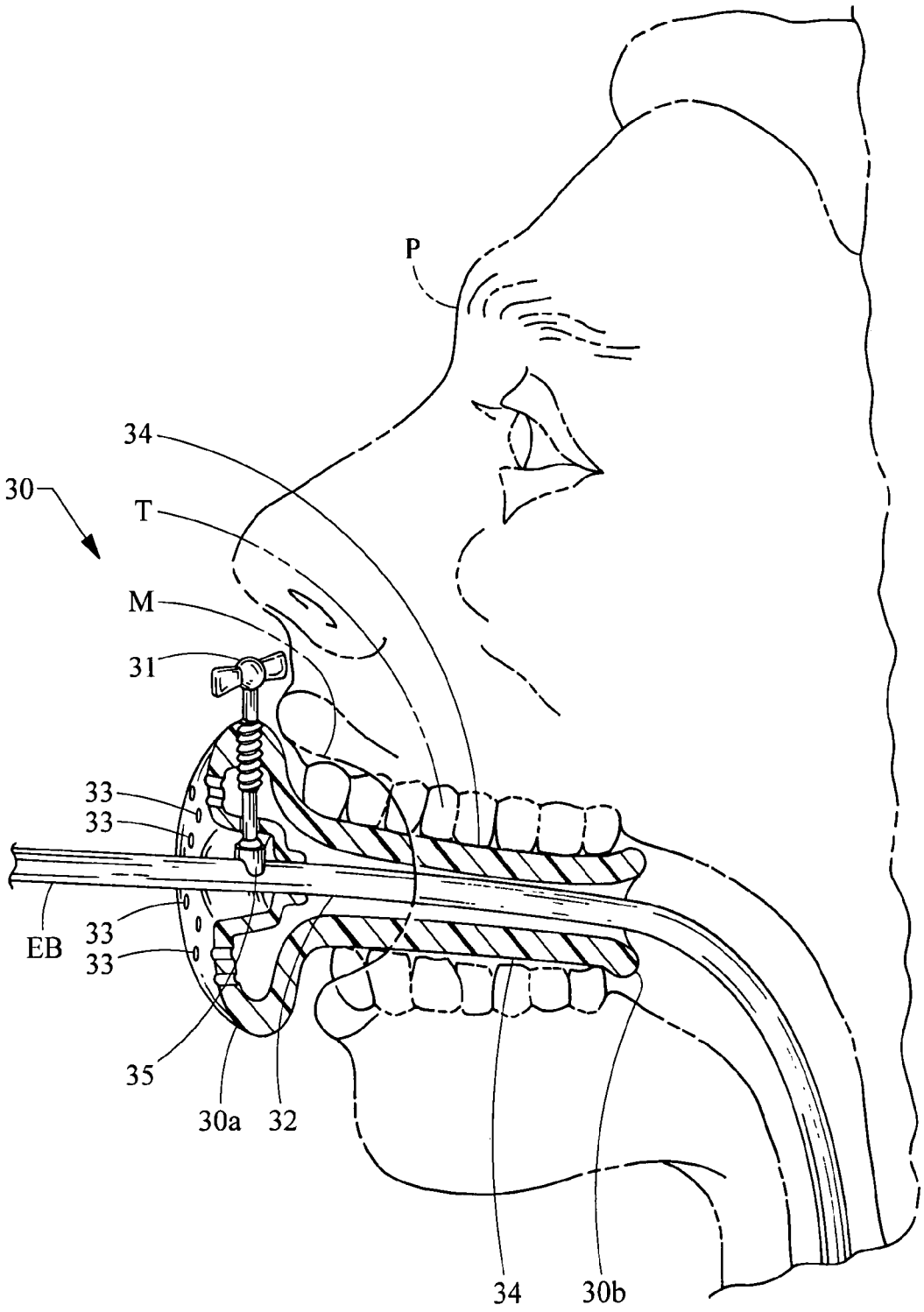

Fig. 4

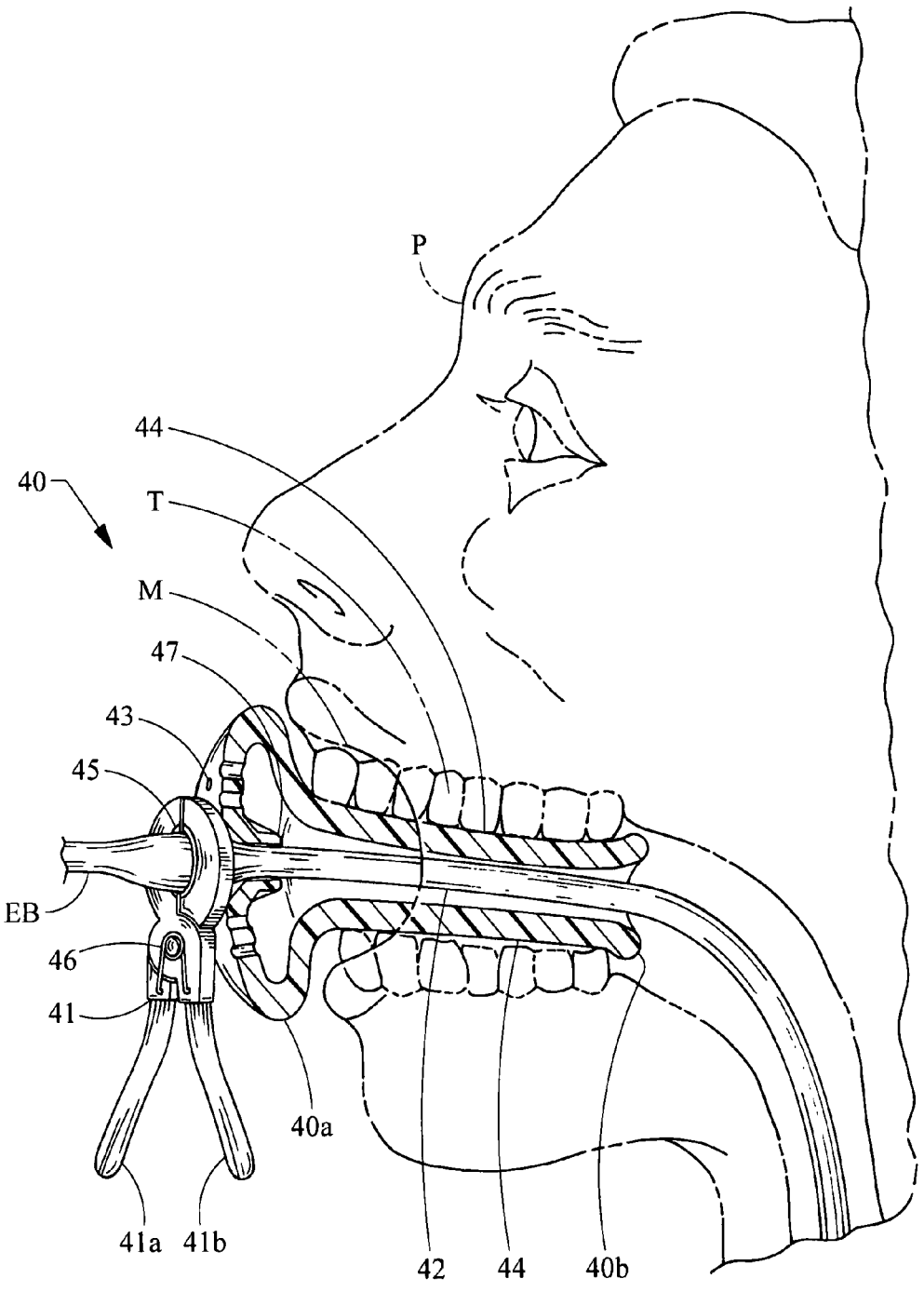

Fig. 5

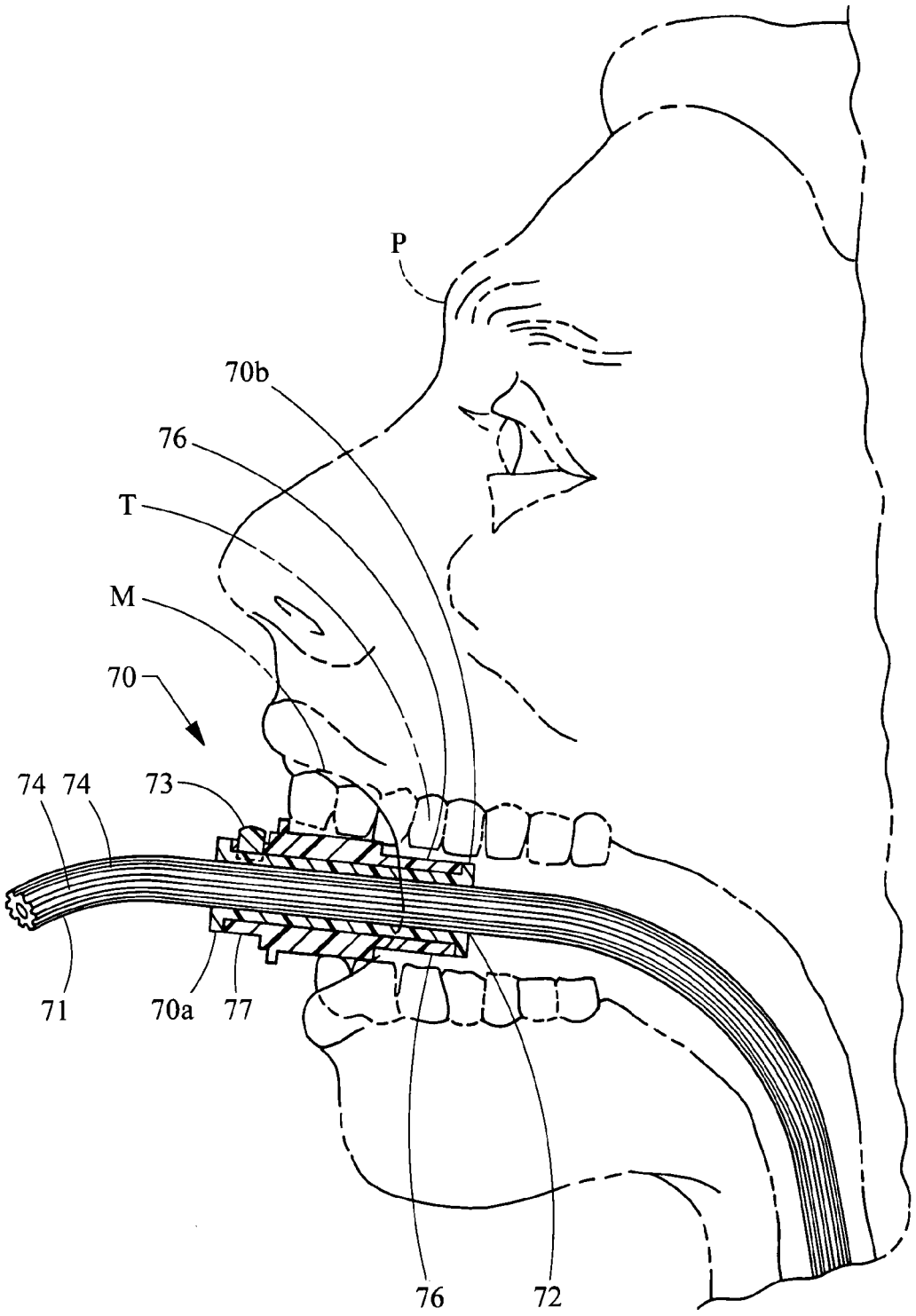

Fig. 6A

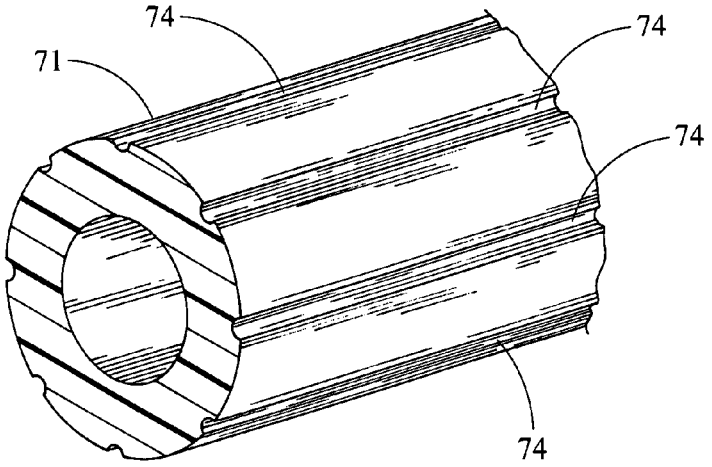

Fig. 6B

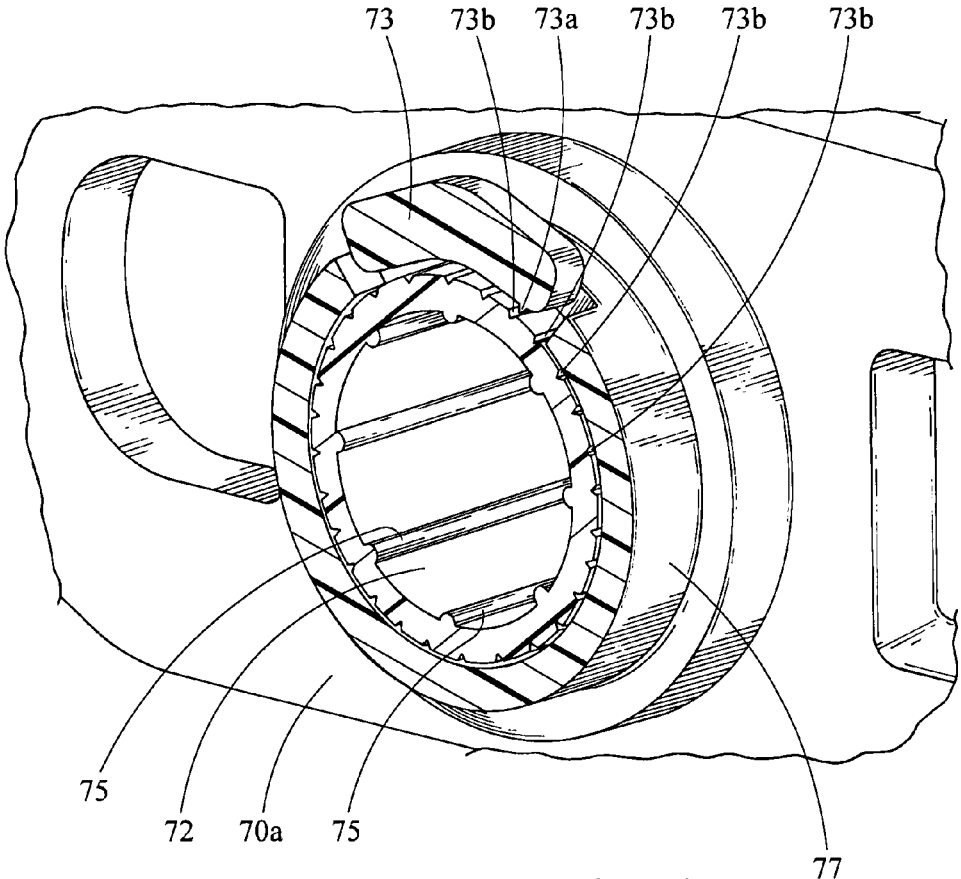

Fig. 6C

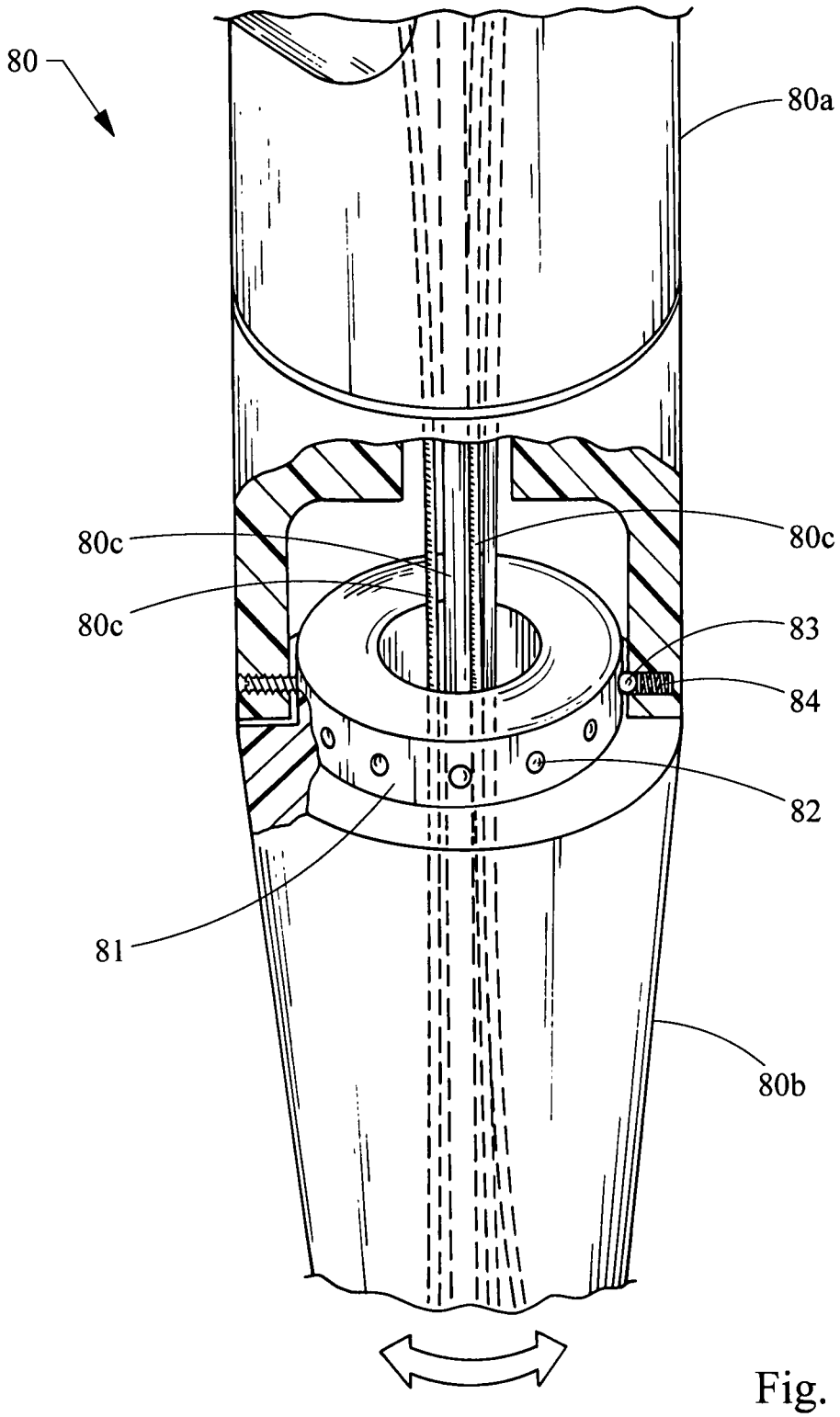

Fig. 7

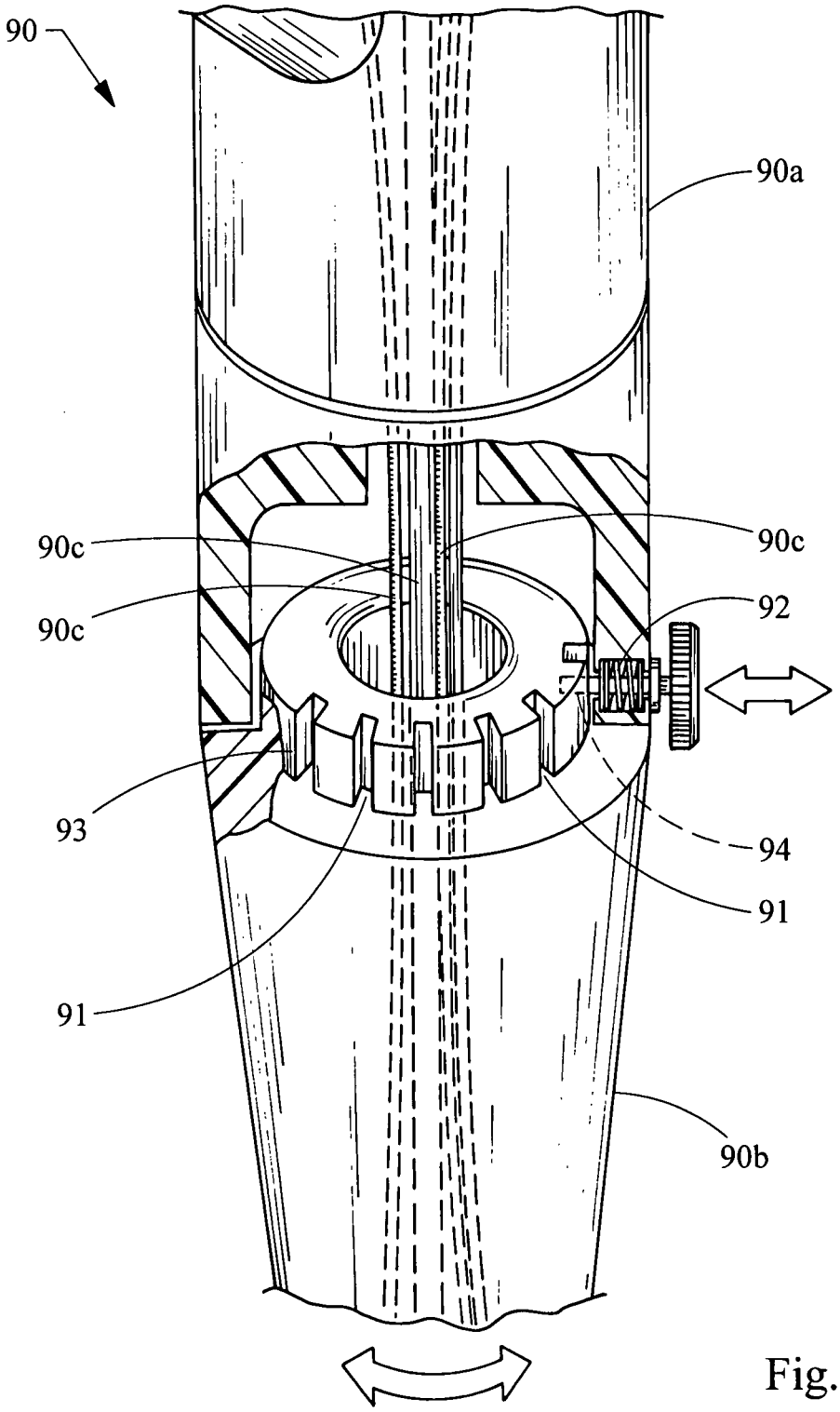

Fig. 8

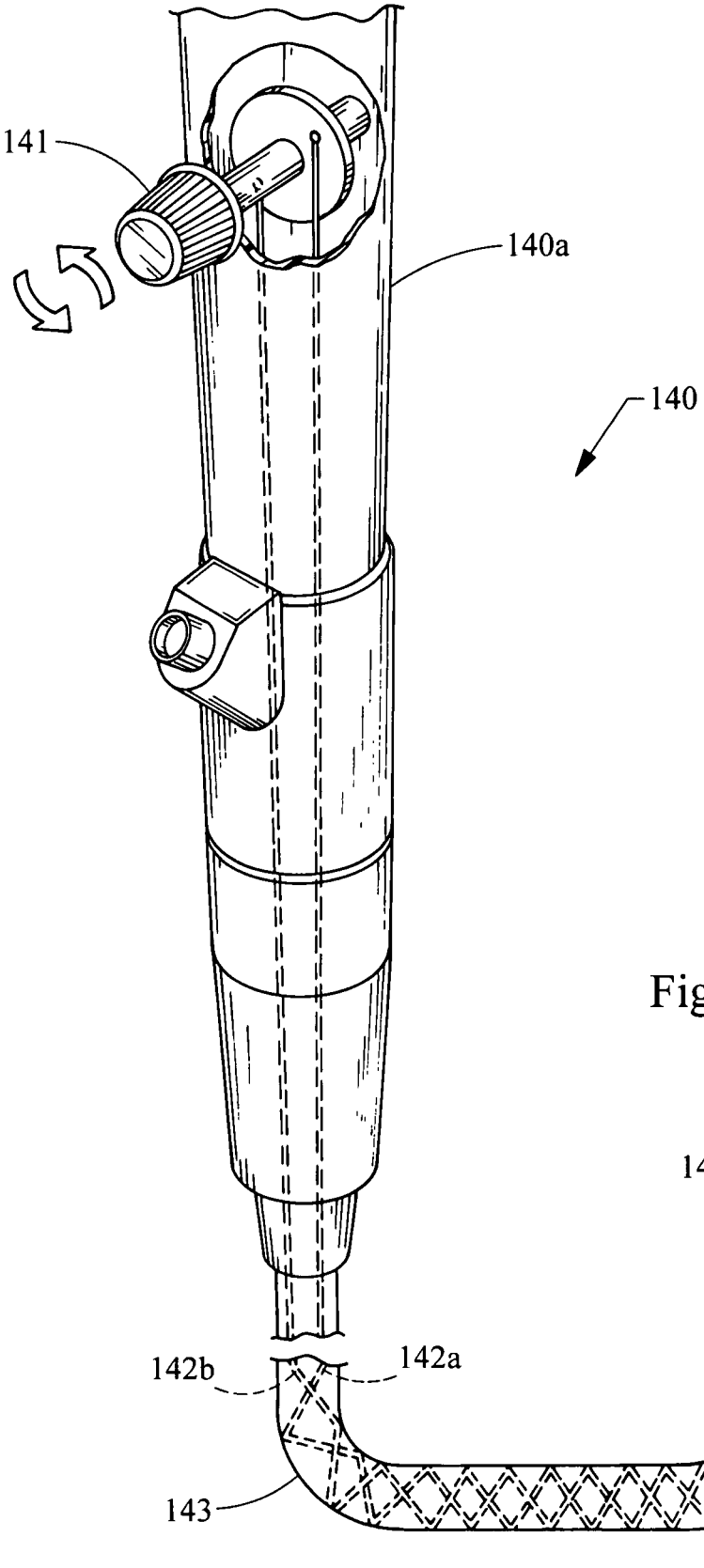

Fig. 9

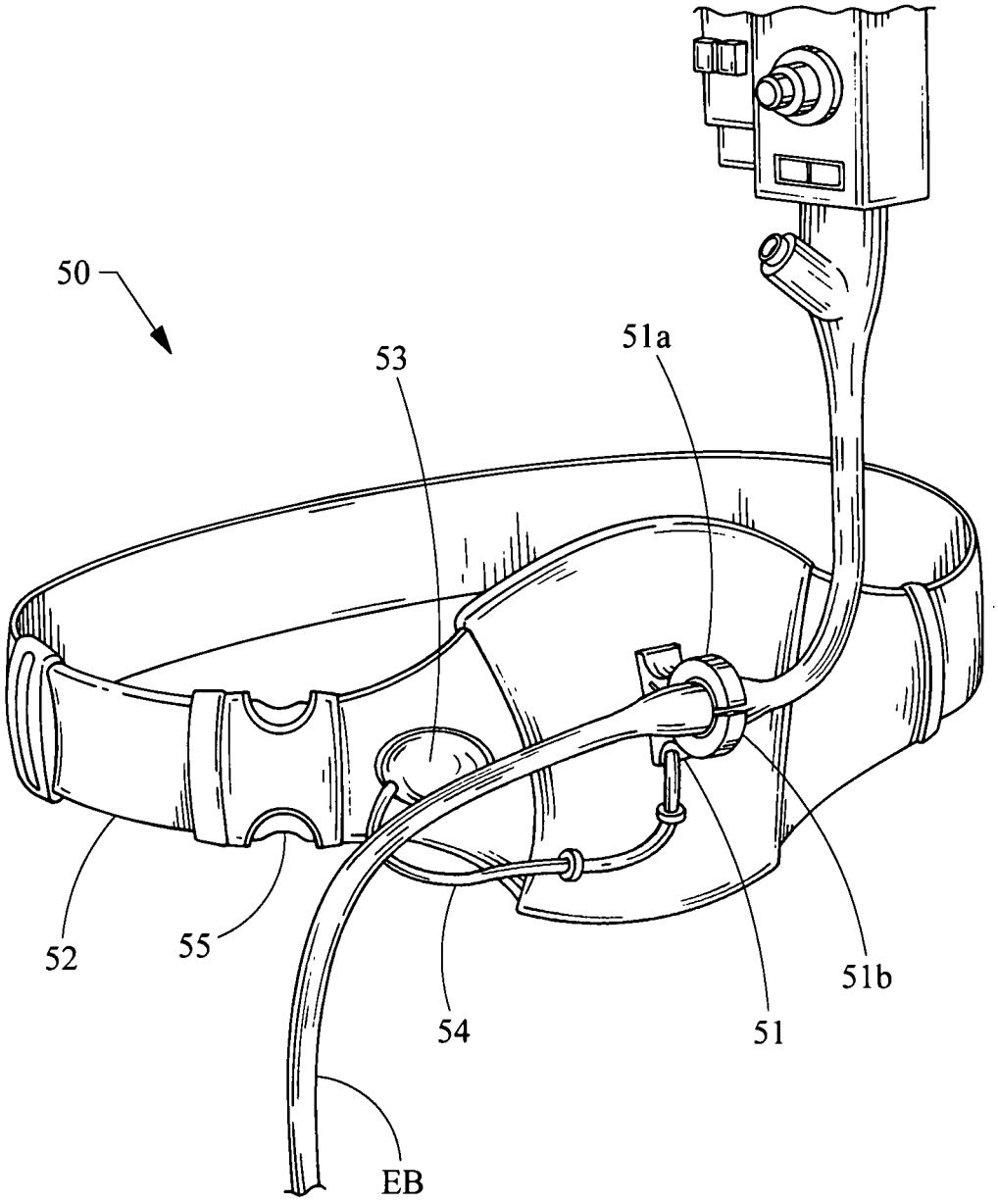

Fig. 10

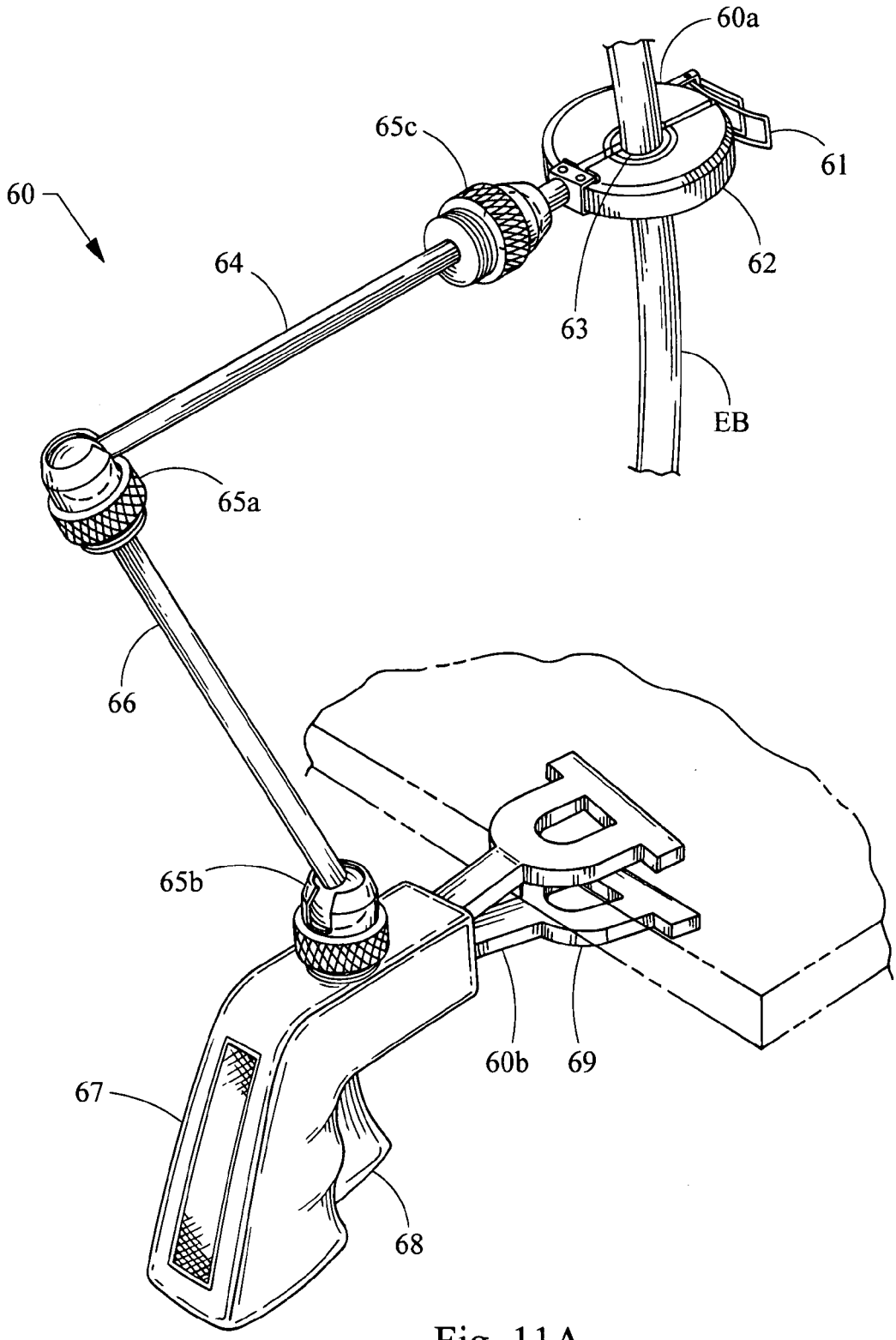

Fig. 11A

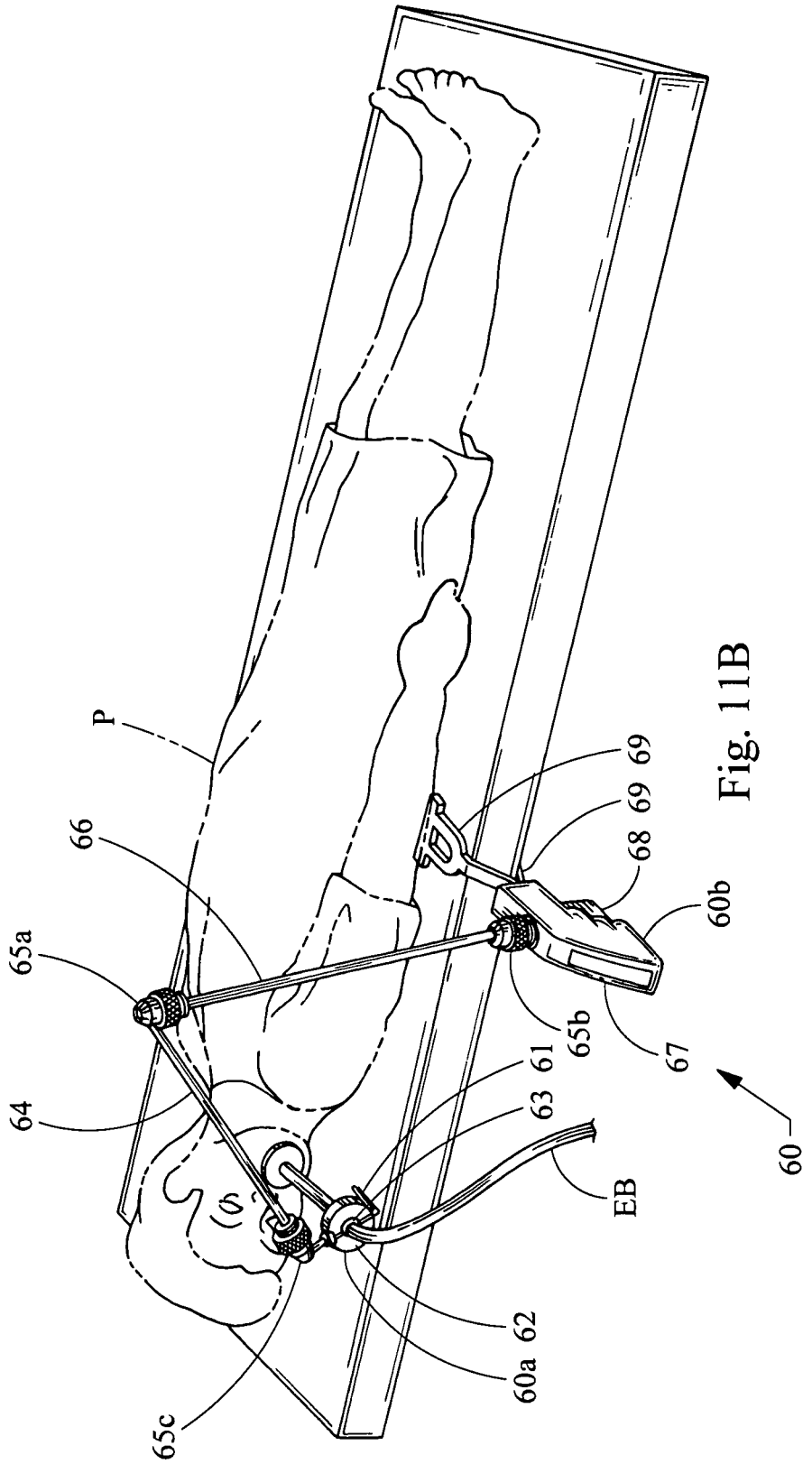

Fig. 11B

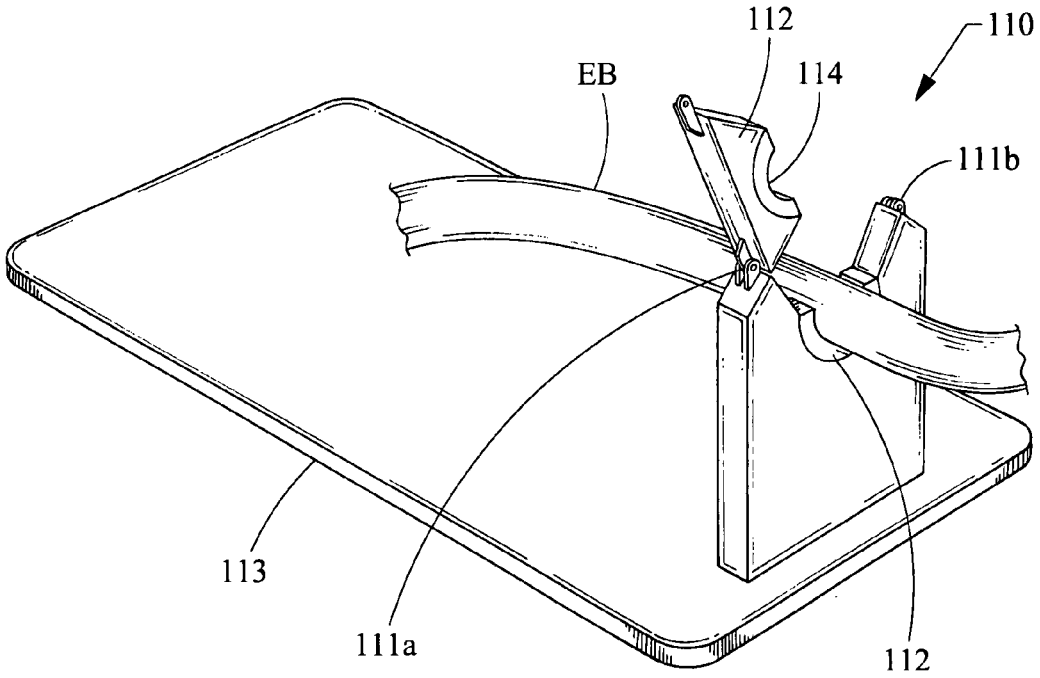

Fig. 12A

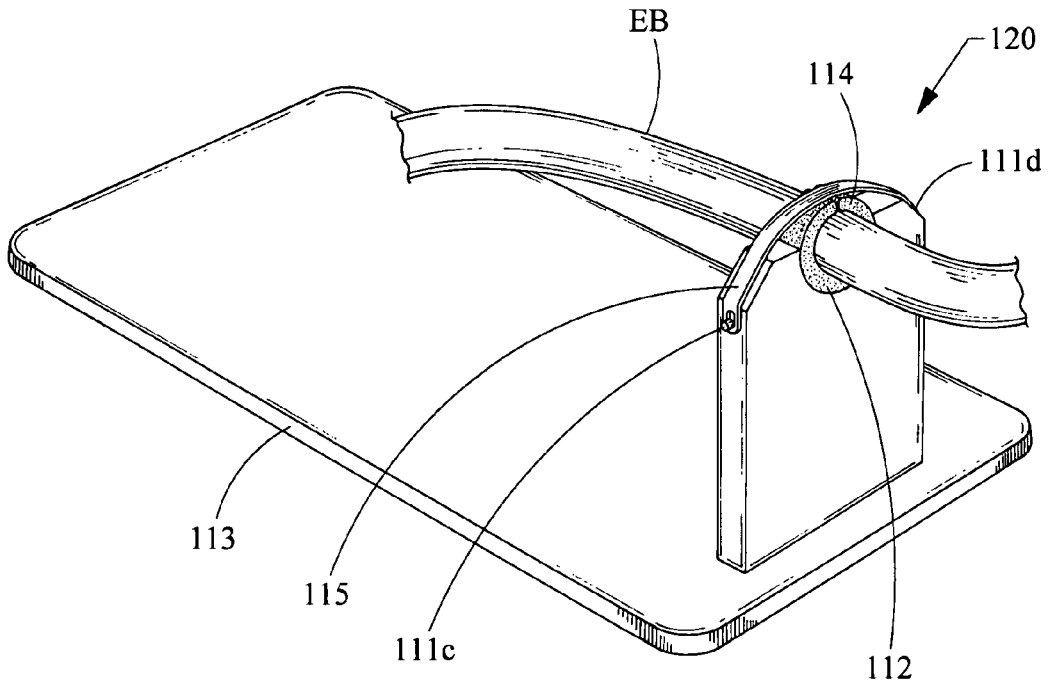

Fig. 13

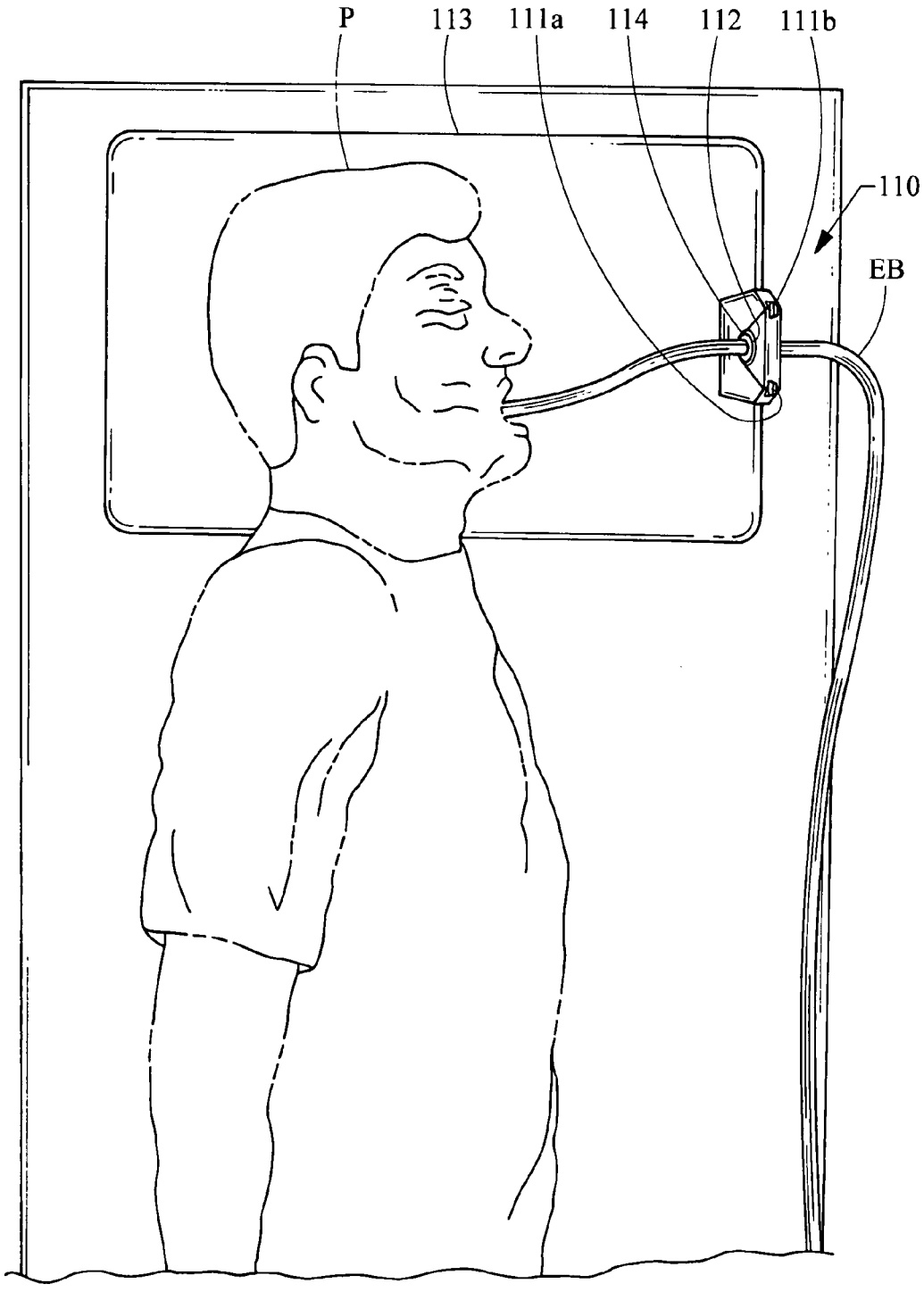

Fig. 12B

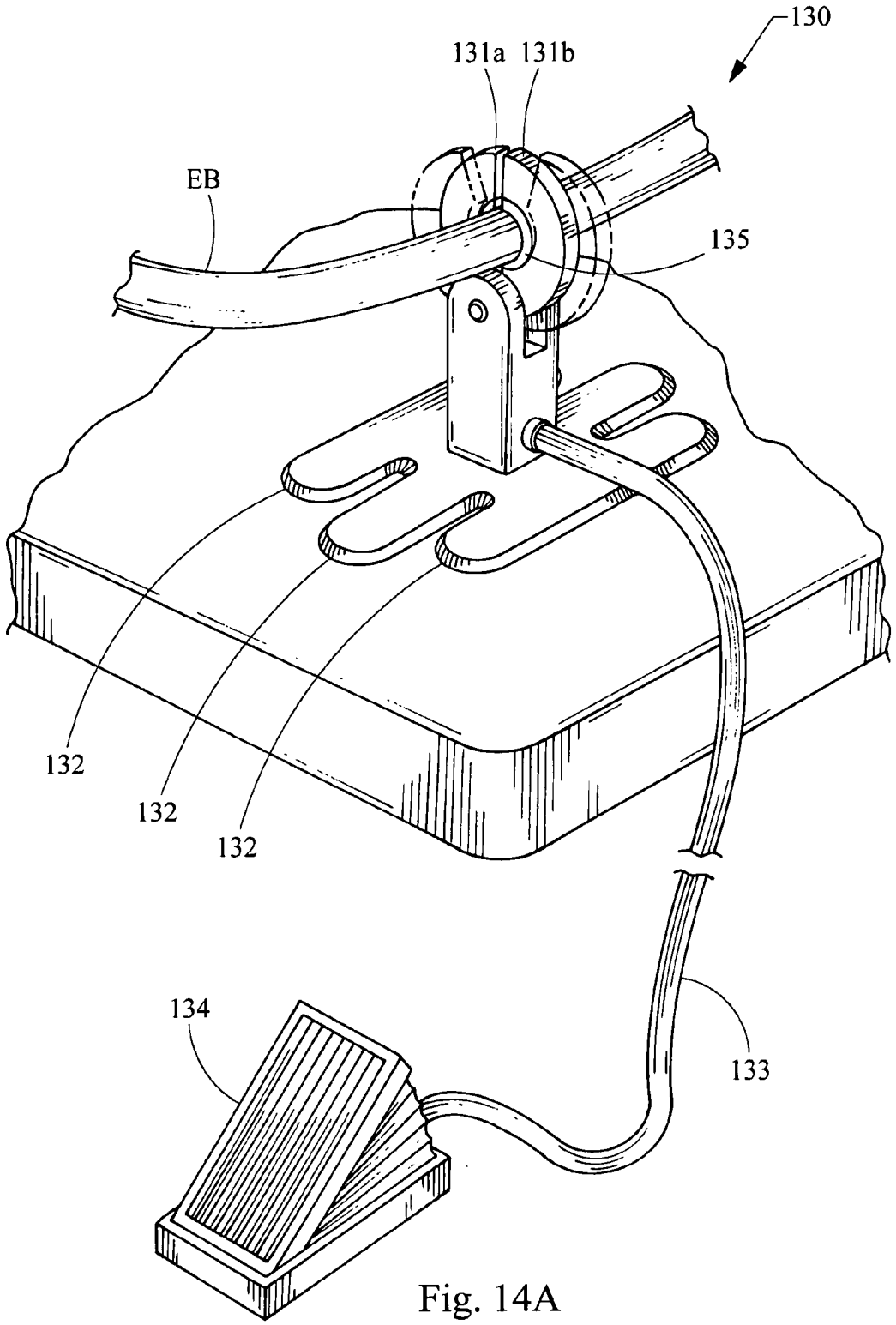

Fig. 14A

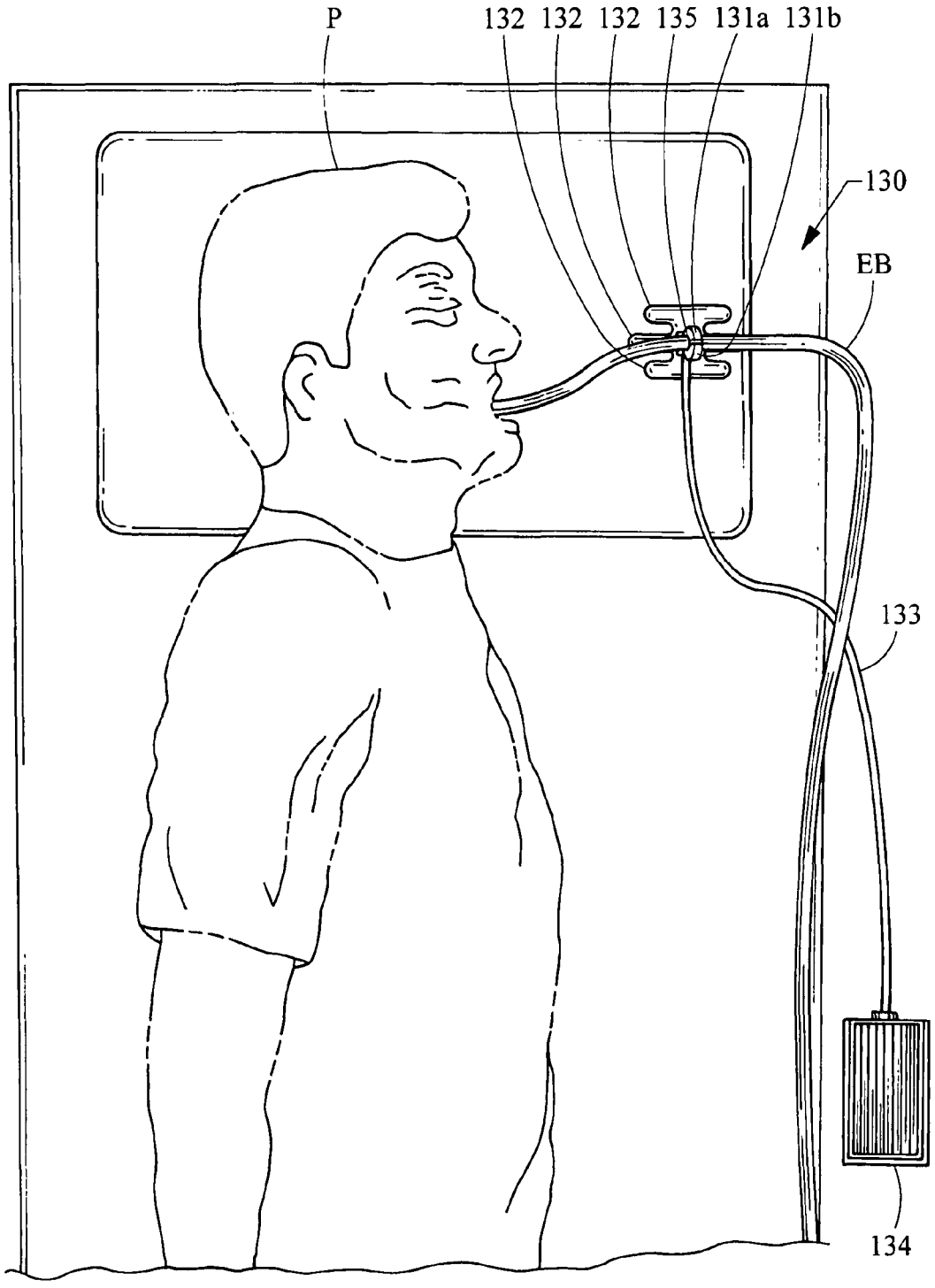

Fig. 14B

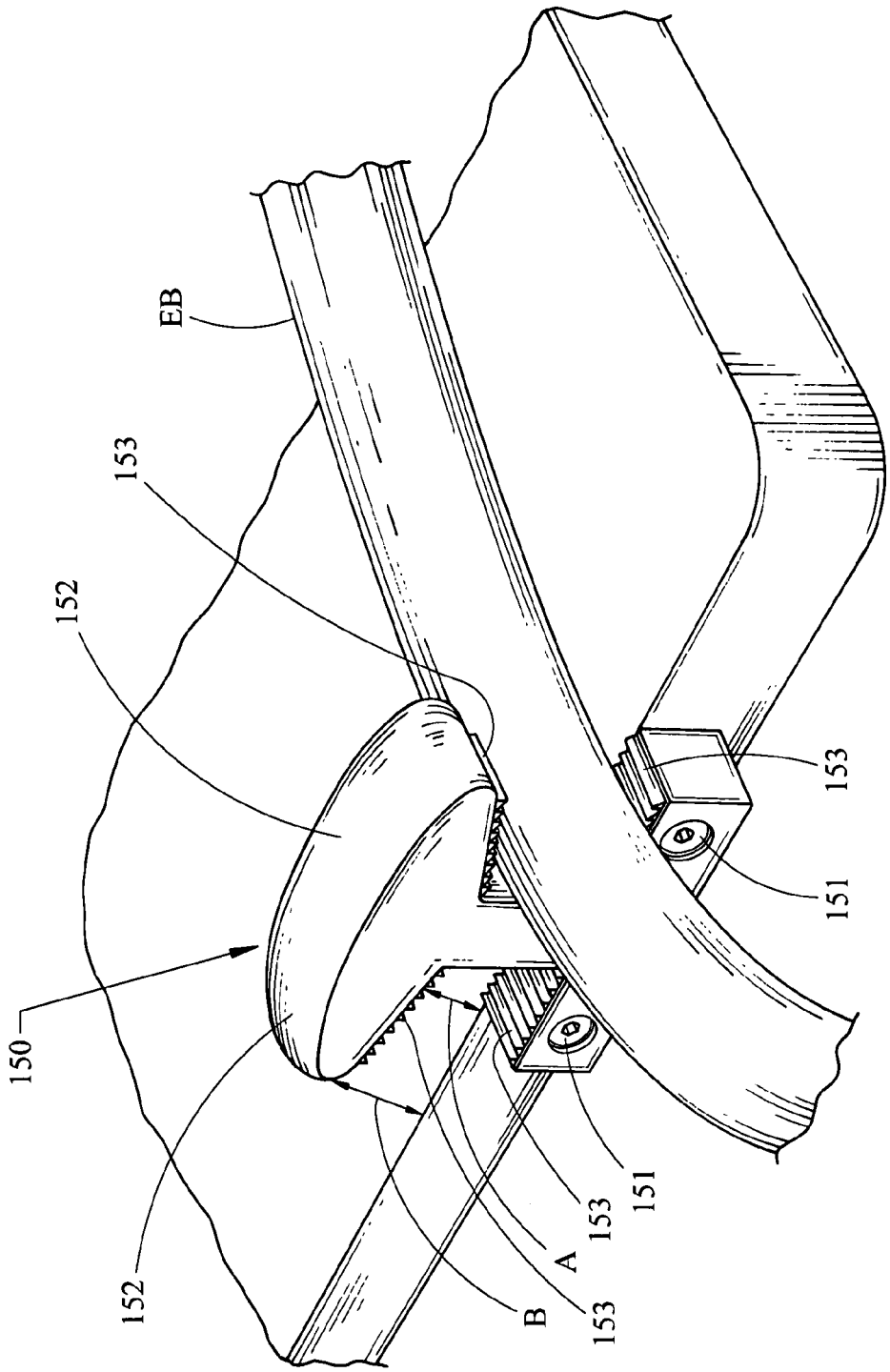

Fig. 15

ENDOSCOPE ROTATIONAL AND POSITIONING APPARATUS AND METHOD

RELATED APPLICATIONS

The present patent document claims the benefit of the filing date under 35 U.S.C. §119(e) of Provisional U.S. Patent Application Ser. No. 60/797,123, filed May 3, 2006, which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

This invention relates to endoscopes used generally for visual examination of a body.

BACKGROUND OF THE INVENTION

Endoscopes are primarily used to visually examine parts of the body including the stomach, colon, intestine, and esophagus. In order to view an inner portion of the body, the medical professional will insert the endoscope into a patient through an orifice.

At the handle portion of the endoscope are a number of controls for deflecting the tip of the endoscope that is within the patient. Such deflection allows the medical professional to better view the bodily interior. The medical professional normally manipulates the control features of the endoscope by holding the handle at chest level with his/her right hand.

In addition to deflecting the tip of the endoscope by using the control handle, the medical professional also rotates the endoscope in order to move to and better view an area of the bodily interior. For example, when used orally, the medical professional rotates the device by having his/her free hand hold a portion of the endoscope just outside the patient's mouth and turning his/her hand from side-to-side. It is difficult for the medical professional to turn the endoscope to any great degree because the medical professional is limited by the degree of rotation that his/her wrist can turn. Once the medical professional reaches that limit, the medical professional must stop and re-grip the endoscope in order to further rotate the device.

A medical professional can also rotate the device by fully extending the potion of the endoscope that remains outside the patient and then turning the device by twisting the hand that is holding the handle of the endoscope. However, the medical professional has less precision when rotating the device in this manner.

The medical professional cannot maintain the rotated position of the endoscope without using his/her hand (or another person's hand) to hold the endoscope in place. This results in the medical professional losing the ability to perform other functions with that hand.

BRIEF SUMMARY OF THE INVENTION

A medical device for use with an endoscope having a handle and an elongated tubular portion extending from the handle is provided. The medical device includes an attachment portion adapted for attachment to the elongated tubular portion of the endoscope, the attachment portion including one of means for adjusting and means for securing the rotational position of the elongated tubular portion of the endoscope.

Additionally, a medical device for use with an endoscope having a handle and an elongated tubular portion extending from the handle is provided. The medical device includes an attachment portion adapted for attaching to the elongated tubular portion of the endoscope. The attachment portion includes means for rotating the elongated tubular portion of the endoscope.

Further, a medical device for use with an endoscope having a handle and an elongated tubular portion extending from the handle is provided. The medical device includes a bite block having a proximal portion, a distal portion, an inner portion, and an outer portion. The inner portion contains a lumen. The lumen has an inner diameter that is greater than the outer diameter of the elongated tubular portion of the endoscope. The lumen is adapted to laterally receive the elongated tubular portion of an endoscope.

Additionally, a medical device for use with an endoscope having a handle and an elongated tubular portion extending from the handle is provided. The medical device includes a belt and a clamp connected to the belt. The clamp is adapted to movably secure the elongated tubular portion of the endoscope.

Furthermore, a medical device for use with an endoscope having a handle and an elongated tubular portion extending from the handle is provided. The medical device includes a cable having a proximal portion and a distal portion. The distal portion is attached to the elongated tubular portion of the endoscope. The medical device also includes a control device. The proximal portion of the cable is attached to the control device. The control device is adapted to control movement of the cable. The cable is adapted to control the movement of the elongated tubular portion of the endoscope.

Additionally, a medical device for use with an endoscope having a handle and an elongated tubular portion extending from the handle is provided. The medical device includes a proximal portion configured to laterally receive and adjustably maintain a position of the elongated tubular portion of the endoscope and a distal portion configured to attach to a stable object.

Furthermore, a medical device for maintaining the torque of an endoscope is provided. The medical device includes an endoscope having a handle, a proximal elongated tubular portion extending from the handle, and a distal elongated tubular portion being rotatable relative to the proximal elongated tubular portion. The medical device further includes a coupling; wherein the coupling is fixedly connected to one of the proximal elongated tubular portion of the endoscope and the distal elongated tubular portion of the endoscope; and wherein the coupling is releasably connected to the other of the proximal elongated tubular portion of the endoscope and the distal elongated tubular portion of the endoscope.

In addition, a medical device for use with an endoscope having a handle and an elongated tubular portion extending from the handle is provided. The medical device includes a cuff adapted to fit around a portion of the elongated tubular portion extending from the handle and a locking mechanism adapted to retain the position of the cuff with respect to the elongated tubular portion of the endoscope.

Furthermore, a method of maintaining the torque of an endoscope is provided. The method includes providing a device for maintaining the torque of an endoscope. The device includes a position engagement device adapted to maintain the position of an endoscope and a position disengagement device adapted to release the position of an endoscope. The method also includes positioning the endoscope within a patient and engaging the position engagement device.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The embodiments will be further described in connection with the attached drawing figures. It is intended that the

drawings included as a part of this specification be illustrative of the embodiments and should in no way be considered as a limitation on the scope of the invention.

FIG. **1**A is a side-view of a patient depicting a use of an endoscope positioning device;

FIG. **1**B is a perspective view of an endoscope positioning device;

FIG. **2** is a side-view of a patient depicting a use of an endoscope securing and positioning device;

FIG. **3** is a side-view of a patient depicting a use of an endoscope securing and positioning device;

FIG. **4** is a side-view of a patient depicting a use of an endoscope securing and positioning device;

FIG. **5** is a side-view of a patient depicting a use of an endoscope securing and positioning device;

FIG. **6**A is a side-view of a patient depicting a use of an endoscope securing and positioning device;

FIG. **6**B is perspective view of a modified endoscope tube;

FIG. **6**C is a front-view of an endoscope securing and positioning device;

FIG. **7** is a front view of a modified endoscope;

FIG. **8** is a front view of a modified endoscope;

FIG. **9** is a perspective view of a modified endoscope; and

FIG. **10** is a front-view of an endoscope securing belt;

FIG. **11**A is a side-view of an endoscope securing and positioning device;

FIG. **11**B is a side view of a patient depicting a use of the endoscope securing and positioning device;

FIG. **12**A is a perspective view of an endoscope securing and positioning device;

FIG. **12**B is a side-view of a patient depicting a use of an endoscope securing and positioning device;

FIG. **13** is a perspective view of an endoscope securing and positioning device;

FIG. **14**A is a perspective view of an endoscope securing and positioning device;

FIG. **14**B is a side-view of a patient depicting a use of an endoscope securing and positioning device; and

FIG. **15** is a perspective view of an endoscope securing and positioning device.

DETAILED DESCRIPTION OF PRESENTLY PREFERRED EMBODIMENTS

The exemplary embodiments disclosed herein allow a medical professional to rotate an endoscope and/or maintain the rotated position of the endoscope.

A more detailed description of the embodiments will now be given with reference to FIGS. **1**A-**15**. Throughout the disclosure, like reference numerals and letters refer to like elements. The present invention is not limited to the embodiments illustrated; to the contrary, the present invention specifically contemplates other embodiments not illustrated but intended to be included in the claims.

FIGS. **1**A and **1**B depict an endoscope positioning device **100** that aids in positioning and twisting an endoscope by giving the medical professional more leverage. Endoscope positioning device **100** includes an arm **102** that is pulled, pushed, or otherwise manipulated in order to rotate the endoscope. Endoscope positioning device **100** is attached to elongated tubular body EB (show in FIG. **1**A) of endoscope via removable cuff **103** that slips over elongated tubular body EB of endoscope. Adjustable screw **101** is used to secure cuff **103** to elongated tubular body EB of endoscope. Adjustable screw **101** has a pad **104** (shown in FIG. **1**B) that frictionally engages endoscope without damaging the outer service of elongated tubular body EB of endoscope. Devices other than an adjustable screw **101** are also contemplated, including, but not limited to, a spring-loaded peg. Screw **101**, arm **102**, and cuff **103** can made from a variety of materials, including but not limited to, stainless steel, polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials.

To use endoscope positioning device **100**, the medical professional places cuff **103** around elongated tubular body EB of endoscope. Screw **101** is tightened such that pad **104** (shown in FIG. **1**B) applies sufficient pressure to elongated tubular body EB of endoscope to prevent movement of cuff **103** with respect to elongated tubular body EB of endoscope. To rotate the endoscope, the medical professional pulls or pushes arm **102**. Use of endoscope positioning device **100** is not limited to those endoscopes that enter through the mouth.

FIG. **2** is a side-view of a patient depicting a use of endoscope securing and positioning device **10**. Endoscope securing and positioning device **10** is placed into mouth M of patient P and has a proximal portion **10**A and a distal portion **10**B. Endoscope securing and positioning device **10** maintains the rotation of an endoscope and also provides protection to elongated tubular body EB of the endoscope from teeth T of patient P. Patient P bites upon the outer portion **13** of endoscope securing and positioning device. Outer portion **13** of endoscope securing and positioning device **10** can be made from any medically acceptable material that is resistant to being damaged by pressure exerted from the mouth M of patient P using teeth T. Such materials include, but are not limited to polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials.

The inside of endoscope securing and positioning device **10** contains a lumen **11** having a diameter that is slightly larger than the outer diameter of elongated tubular body EB of the endoscope in order to allow elongated tubular body EB of the endoscope to pass there through. Endoscope securing and positioning device **10** also includes air holes **12** so that patient P can breathe through mouth M.

To use endoscope securing and positioning device **10**, the medical professional places endoscope securing and positioning device **10** into mouth M of patient P such that distal portion **10**B is nearest to the esophagus of patient P. Cuff **14** is placed around elongated tubular body EB of endoscope. Cuff **14** is a machined thermal plastic wedge-shaped attachment, however, it may also be made from a variety of other materials, including but not limited to, metal, polycarbonate, ABS, epoxies, and diallyl phthalate. Cuff **14** is 4"-5" long; however, other dimensions are also contemplated. The portion of elongated tubular body EB of the endoscope having cuff **14** is threaded through lumen **11** of endoscope securing and positioning device **10** at proximal portion **10**A and is positioned as needed. Cuff **14** is engaged with the sides of lumen **11** so as to create a frictional force upon cuff **14** resulting in the position of elongated tubular body EB being maintained.

In order to reposition elongated tubular body EB, cuff **14** is pulled in the proximal direction of lumen **11** in order to cause lumen **11** not to engage cuff **14**. Without the frictional force, cuff **14** no longer maintains the position of elongated tubular body EB; cuff **14** looses from around elongated tubular body EB thereby allowing cuff **14** to be repositioned along elongated tubular body EB; and elongated tubular body EB is able to be repositioned with respect to patient P. Once elongated tubular body EB is repositioned, cuff **14** is wedged back into lumen **11** to secure and maintain the position of elongated tubular body EB. Lumen **11** is lined with a rubber (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to prevent

damage to elongated tubular body EB of endoscope as well as to increase friction there between.

FIG. **3** depicts another endoscope securing and positioning device **20** similar to the one depicted in FIG. **2**. In FIG. **3**, endoscope securing and positioning device **20** has a proximal portion **20**A and a distal portion **20**B. Endoscope securing and positioning device **20** maintains the rotation of elongated tubular body EB of the endoscope and also protects elongated tubular body EB of the endoscope from damage due to teeth T of patient P. Air holes **24** are provided so that patient P can breath through mouth M.

Patient P bites down on outer portion **25** of endoscope securing and positioning device **20**. Outer portion **25** of endoscope securing and positioning device **20** can be made from any medically acceptable material that is resistant to being damaged by pressure exerted from the mouth M of patient P using teeth T; polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may be used. Endoscope securing and positioning device **20** has a lumen **23** having a diameter that is slightly larger than the outer diameter of elongated tubular body EB of the endoscope in order to allow elongated tubular body EB of the endoscope to pass there through. A spring loaded depressor **21**, containing a spring **22**, is used to maintain the position of elongated tubular body EB of the endoscope by applying pressure to the exterior of elongated tubular body EB of the endoscope so as to prevent lateral and rotational movement thereof. Depressor **21** can be made from any sturdy material, including, but not limited to, polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials. Spring **22** can be made from materials including, but not limited to, stainless steel. Tip of depressor **26** is contoured and lined with rubber (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to prevent damage to elongated tubular body EB of endoscope as well as to increase friction there between. To disengage depressor **21**, the medical professional pulls depressor **21** upward which releases elongated tubular body EB of endoscope. To engage depressor **21**, the medical professional releases depressor **21** causing depressor **21** to apply pressure to the outer service of elongated tubular body EB.

FIG. **4** depicts another endoscope securing and positioning device **30** that is similar to those depicted in FIGS. **2** and **3**. In FIG. **4**, endoscope securing and positioning device **30** has a proximal portion **30**A and a distal portion **30**B. Endoscope securing and positioning device **30** maintains the rotation of elongated tubular body EB of the endoscope and also protects elongated tubular body EB of the endoscope from damage due to teeth T of patient P. Air holes **33** are provided so that patient P can breath through mouth M.

Patient P bites down on outer portion **34** of endoscope securing and positioning device **30**. Outer portion **34** of endoscope securing and positioning device **30** can be made from any medically acceptable material that is resistant to being damaged by pressure exerted from the mouth M of patient P using teeth T; polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used. Endoscope securing and positioning device **30** contains a lumen **32** having a diameter that is larger than the outer diameter of elongated tubular body EB of the endoscope in order to allow elongated tubular body EB of the endoscope to pass there through. A screw **31** is used to maintain the position of elongated tubular body EB of the endoscope by applying pressure on the exterior of elongated tubular body EB of the endoscope so as to prevent the lateral and rotational movement thereof. Screw **31** can be made from any sturdy material, including but not limited to, stainless steel. Screw **31** has a handle portion that is adapted to allow screw **31** to be rotated without having to use a screwdriver. Tip of screw **35** is contoured and lined with rubber (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to prevent damage to elongated tubular body EB of endoscope as well as to increase friction there between.

When screw **31** is engaged, screw **31** holds elongated tubular body EB of the endoscope and prevents lateral and rotational movement of elongated tubular body EB of the endoscope. Therefore, because disengagement of screw **31** is necessary to adjust the position of elongated tubular body EB of the endoscope, the medical professional can maintain the position of elongated tubular body EB of the endoscope without needing to use a hand to hold elongated tubular body EB of the endoscope in the required position. To reposition elongated tubular body EB of the endoscope horizontally or rotationally, the medical professional disengages screw **31** by turning screw **31** counterclockwise until it releases the hold on elongated tubular body EB of the turning it clockwise until it engages and holds elongated tubular body EB of the endoscope in place.

FIG. **5** depicts another endoscope securing and positioning device **40** similar to those depicted in FIGS. **2-4**. Endoscope securing and positioning device **40** has a proximal portion **40**A and a distal portion **40**B. Endoscope securing and positioning device **40** maintains the rotation of elongated tubular body EB of the endoscope and also protects elongated tubular body EB of the endoscope from damage due to teeth T of patient P. Air holes **43** are provided so that patient P can breath through mouth M.

Patient P bites down on outer portion **44** of endoscope securing and positioning device **40**. Outer portion **44** of endoscope securing and positioning device **40** can be made from any medically acceptable material that is resistant to being damaged by pressure exerted from the mouth M of patient P using teeth T; polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used. Endoscope securing and positioning device **40** contains a lumen **42** having a diameter that is larger than the outer diameter of elongated tubular body EB of the endoscope in order to allow elongated tubular body EB of the endoscope to pass there through.

Endoscope securing and positioning device **40** includes a clamp **41** that is used to maintain the position of elongated tubular body EB of the endoscope. Clamp **41** can be made from materials including, but not limited to, stainless steel. Spring **46** biases handles together to close clamp **41**, such that clamp compresses elongated tubular body EB in order to maintain the position of the endoscope. To disengage clamps, the medical professional pulls apart clamp handles **41**A, **41**B. This releases clamp and allows the medical professional to reposition elongated tubular body EB. Clamp **41** is lined **45** with a rubber material (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to prevent damage to elongated tubular body EB of endoscope as well as to increase friction there between.

FIGS. **6**A and **6**C depict another endoscope securing and positioning device **70** having a proximal portion **70**A and a distal portion **70**B. Endoscope securing and positioning device **70** maintains the position of elongated tubular body **71**. In this embodiment, elongated tubular body **71** of endoscope is modified such that it contains locking grooves **74** as depicted in FIGS. **6**A and **6**B. Thus, when elongated tubular body **71** is inserted through lumen **72**, grooves **74** engage with the locking teeth **75** (shown in FIG. **6**C) of endoscope secur-

ing and positioning device **70**. Grooves **74** engage with locking teeth **75** to prevent the rotational movement of elongated tubular body **71** but still allow for independent axial movement. Patient P bites with teeth T upon outer portion **76** of endoscope securing and positioning device **70** in order to prevent elongated tubular body **71** from damage due to teeth T. It is also contemplated that this device can contain air holes so that patient P can breath through the mouth M.

To rotate elongated tubular body **71**, the medical professional releases button **73** and rotates race **77** until the desired position of elongated tubular body **71** is reached. Once the desired position is reached, the medical professional re-engages locking button **73** by rocking it so that button **73** locks race **77** into place by having protrusion **73**A engage with one of the multiple grooves **73**B (as shown in FIG. **6**C). The dimension of grooves **73**B is approximately 0.002" deep by 0.002" wide; however, other dimensions are contemplated. Because endoscope securing and positioning device **70** maintains the position of endoscope tube **71**, the medical professional does not need to hold elongated tubular body **71** in the rotated position. A sleeve having a grooved outer service could be disposed about the endoscope as opposed to modifying the outer surface thereof.

FIG. **7** depicts a modified endoscope. Distal portion **80**B of positionable endoscope **80** is rotatable relative to proximal portion **80**A. Proximal portion **80**A of positionable endoscope **80** is fixedly attached to coupling **81**. Inside coupling **81** is a ball bearing **83**, a spring **84** and bearing locks **82**.

The medical professional rotates distal portion **80**B of positionable endoscope **80** which causes spring **84** to decompress as ball bearing **83** rotates into one of the bearing locks **82**. Once ball bearing **83** is secure in one of the bearing locks **82**, the rotated position of distal portion **80**B of positionable endoscope **80** will be maintained until sufficient rotational force is applied to distal portion **80**B of positionable endoscope **80** to cause spring **84** to decompress and ball bearing **83** to rotate around into the next adjacent bearing lock **82**. In order to avoid breaking the inner workings **80**C of the endoscope (which may include traditional control devices for controlling a camera and for deflecting the tip of the endoscope), care should be taken not to rotate coupling **81** more than 180 degrees.

FIG. **8** depicts another positionable endoscope **90** like that depicted in FIG. **7**. Distal portion **90**B of positionable endoscope **90** is rotatable relative to proximal portion **90**A. Proximal portion **90**A of positionable endoscope **90** is fixedly attached to coupling **93**. Coupling **93** contains locking ridges **91** which engage with locking peg **94** which is attached to spring-loaded knob **92**.

To rotate distal portion **90**B of positionable endoscope **90**, the medical professional pulls spring-loaded knob **92** to disengage it and rotates distal portion **90**B of positionable endoscope **90**. Once distal portion **90**B is rotated into position, spring-loaded knob **92** is reengaged causing locking peg **94** to engage with locking ridge **91**. In order to avoid breaking the inner workings **90**C of the endoscope (which may include traditional control devices for controlling a camera and for deflecting the tip of the endoscope), care should be taken not to rotate coupling **93** more than 180 degrees.

FIG. **9** depicts a modified endoscope that is able to deflect and rotate elongated tubular body **143**. Positionable endoscope **140** is equipped with cables **142**A, **142**B that are located along the interior portion of the endoscope starting at wheel **141** through elongated tubular body **143** where they become spirally attached to elongated tubular body **143**. Cables **142**A, **142**B are braided and made from stainless steel, although other configurations and materials are contemplated.

To use positionable endoscope **140**, the medical device inserts distal end **140**B of positionable endoscope **140** into the patient. To help position the device, the medical professional rotates wheel **141** counter-clockwise causing cable **142**A to retract, thereby causing distal end **140**B of elongated tubular body **143** to deflect and rotate in the direction that cable **142**A pulls it. To un-deflect and un-rotate elongated tubular body **143**, the medical professional rotates wheel **141** in the opposite direction until cable **142**A is unwound causing elongated tubular body **143** to relax and straighten. To deflect the tip in the opposite direction, the medical professional rotates wheel **141** clockwise causing cable **142**B to retract, thereby causing distal end **140**B of elongated tubular body **143** to deflect and rotate in the direction that cable **142**B pulls it. To un-deflect and un-rotate elongated tubular body **143**, the medical professional rotates wheel **141** in the opposite direction until cable **142**B is unwound causing elongated tubular body **143** to relax and straighten.

FIG. **10** is a front-view of endoscope securing belt **50**. Endoscope securing belt **50** includes a clamp **51** having clamp arms **51**A, **51**B. Clamp **51** maintains the position of elongated tubular body EB of the endoscope. To use endoscope securing belt **50**, the medical professional positions belt strap **52** around his/her waist and connects clasp **55**. Belt strap **52** maintains the position of endoscope securing belt **50** onto medical professional when clasp **55** is engaged.

The medical professional disengages clamp **51** by pressing on clamp release bulb **53** that is connected to clamp **51** via a clamp release line **54**. Clamp release bulb **53** and clamp release line **54** contain a fluid such as air. Compressing clamp release bulb **53** compresses the fluid inside. As it does so, a pneumatic force is created such that it causes clamp arms **51**A, **51**B to overcome the opposing force of a spring (not shown) and separate apart. Alternatively, instead of using a fluid, a mechanical drive cable could also be used to actuate/open clamp arms **51**A, **51**B.

When clamp arms **51**A, **51**B are disengaged, elongated tubular body EB of the endoscope may be freely positioned into an orifice of a patient. Once elongated tubular body EB of the endoscope is in position, the medical professional reengages clamp **51** by releasing clamp release bulb **53** causing clamp arms **51**A, **51**B to come together and hold elongated tubular body EB of the endoscope in place.

FIGS. **11**A and **11**B depict another endoscope securing and positioning device **60**. In FIG. **11**A, endoscope securing and positioning device **60** is shown having a proximal portion **60**A and a distal portion **60**B. Endoscope securing and positioning device **60** maintains the position of elongated tubular body EB of endoscope. Located at distal end **60**B of endoscope securing and positioning device **60** is bed clamp **69** that clamps to a bed, table, or any other stable item near patient. Engaging and disengaging bed clamp **69** is controlled by pulling trigger **68** that is attached to handle **67**. Handle **67** is attached to arm **66** by lockable ball joint **65**B to allow for rotation, lateral, and longitudinal movement of arm **66**. Arm **66** is attached to arm **64** via lockable ball joint **65**A to allow for the rotational, lateral, and longitudinal movement of arm **64**. Alternatively, arms **64**, **66** could also be a spring-loaded four-bar mechanism.

Clamp **62** is attached to arm **64** via lockable ball joint **65**C to allow for rotational movement of clamp **62**. Clamp **62** is lined with a rubber material **63** (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to prevent damage to elon-

gated tubular body EB of endoscope as well as to increase friction there between. Clamp lock **61** locks clamp **62** around elongated tubular body EB of endoscope.

FIG. **11**B depicts a use of the device depicted in FIG. **11**A. Here, clamp lock **61** is engaged, thus causing locking clamp **62** to maintain the position of elongated tubular body EB within patient P. To adjust elongated tubular body EB, the medical professional moves arms **64** or **66** into the proper position. To rotate elongated tubular body EB, clamp lock **61** is disengaged causing clamp **62** to open and release its hold on elongated tubular body EB. Once elongated tubular body EB is positioned EB, clamp lock **61** is reengaged. Use of endoscope securing and positioning device **60** is not limited to those endoscope that enter through the mouth.

FIG. **12**A depicts an endoscope securing and positioning device **110** that is shown in use in FIG. **12**B. Endoscope securing and positioning device **110** includes a board **113** on which patent P rests. Board **113** is connected to a cuff **112** for securing and positioning elongated tubular body EB of endoscope. Cuff **112** is lined with a rubber material **114** (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to protect the outside service of elongated tubular body EB from damage. When locked using locking hinge **111**B, cuff presses against elongated tubular body EB preventing lateral and rotational movement. When locking hinge **111**B is disengaged, cuff opens at hinge **111**A and allows elongated tubular body EB to be repositioned. Board **113**, cuff **112**, hinge **111**A, and locking hinge **111**B can be made from a variety of materials including, but not limited to, polyurethane, polytetrafluoroethylene, other suitable polymers, stainless steal, and other suitable materials. Use of endoscope securing and positioning device **110** is not limited to those endoscopes that enter through the mouth.

FIG. **13** depicts another embodiment of the endoscope securing and positioning device depicted in FIGS. **12**A and **12**B. Endoscope securing and positioning device **120** has a locking band **115** that removably attaches at **111**C and **111**D in order to prevent rotational and axial movement of elongated tubular body EB. Locking band **115** can be made from a variety of materials, including, but not limited to, rubber.

FIG. **14**A depicts an endoscope securing and positioning device **130** that is shown in use in FIG. **14**B. Use of endoscope securing and positioning device **130** is not limited to those endoscopes that enter through the mouth. Endoscope securing and positioning device **130** is placed near patient P. Endoscope securing and positioning device **130** has a clamp **131**A, **131**B that opens when foot pedal **134** is pressed, and closes when foot pedal **134** is released. Foot pedal **134** is connected via clamp release line **133**.

Foot petal **134** and clamp release line **133** contain a fluid such as air. Compressing foot petal **134** compresses the fluid inside. As it does so, a pneumatic force is created such that it causes clamp **131**A, **131**B to overcome the opposing force of a spring (not shown) and separate apart. Alternatively, instead of using a fluid, a mechanical drive cable could also be used to actuate/open clamp **131**A, **131**B.

While foot pedal **134** pressed, elongated tubular body EB of endoscope is thread through clamp **131**A, **131**B and positioned. Once positioned, foot pedal **134** is released causing clamp **131**A, **131**B to close and maintain the position of elongated tubular body EB of endoscope. The interior surface of clamps **135** is lined with a rubber material (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to prevent damage to elongated tubular body EB of endoscope as well as to increase friction there between. Feet **132** provide stability to endoscope securing and positioning device **130** to prevent it from tipping. Endoscope securing and positioning device **130** can be made out of many materials, including but not limited to, aluminum, stainless steel, polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials. Endoscope securing and positioning device **130** should be sufficiently heavy in order to maintain the position of elongated tubular body EB of endoscope. Thus, a weight of five pounds is generally sufficient although heavier or lighter devices are contemplated.

FIG. **15** depicts another embodiment of an endoscope securing and positioning device **150** that is attached to a bed or table via bolts **151**. Although bolted in this embodiment, endoscope securing and positioning device **150** can be attached in a variety of different ways, including but not limited to, clamps. The gap at line A-A is about 10 mm whereas the gap at line B-B is about 20 mm. Greater or lesser gap distances can be used, however, the gap distance should be such that it holds elongated tubular body EB of endoscope in place. Endoscope securing and positioning device **150** can be made out of many materials, including but not limited to, aluminum, stainless steel, polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials.

To use endoscope securing and positioning device **150**, the medical professional threads elongated tubular body EB of endoscope under arm **152**. Arm **152** is shaped in such a way that as elongated tubular body EB of endoscope attempts to un-rotate itself, the arm **152** tightens and maintains the position of elongated tubular body EB of endoscope. Arm **152** is lined **153** with rubber (polyurethane, polytetrafluoroethylene, other suitable polymers, and other suitable materials may also be used) in order to prevent damage to elongated tubular body EB of endoscope as well as to increase friction there between. Endoscope securing and positioning device **150** may also include a threaded portion so that the gap distances (A-A, B-B) can be adjusted.

The foregoing description and drawings are provided for illustrative purposes only and are not intended to limit the scope of the invention described herein or with regard to the details of its construction and manner of operation. It will be evident to one skilled in the art that modifications and variations may be made without departing from the spirit and scope of the invention. Changes in form and in the proportion of parts, as well as the substitution of equivalence, are contemplated as circumstances may suggest and render expedience; although specific terms have been employed, they are intended in a generic and descriptive sense only and not for the purpose of limiting the scope of the invention set forth in the following claims.

What is claimed is:

1. A securing mechanism comprising:

an endoscope having a handle and an elongated tubular portion extending from the handle, the elongated tubular portion comprising a plurality of axially extending grooves,

an engagement portion adapted for engagement with the elongated tubular portion of the endoscope, the engagement portion comprising a plurality of teeth engaged with the grooves so as to secure the rotational position of the elongated tubular portion of the endoscope without inhibiting axial movement of the elongated tubular portion of the endoscope relative to the securing mechanism, wherein the engagement portion is rotatably disposed within a circular race of the securing mechanism,

wherein the securing mechanism comprises a button adapted for selectively allowing or preventing rotation of the engagement portion relative to the circular race,

and wherein the securing mechanism is configured for attachment to a patient, and

further comprising a bite block having a proximal portion, a distal portion, an inner portion, and an outer portion, wherein the inner portion contains a lumen; wherein the engagement portion is disposed within the lumen of the inner portion.

2. The securing mechanism of claim **1** further comprising at least one air hole.

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